

Good morning/afternoon. My name is Matthew Tuck. I am part of the Verizon Global Network Operations team, and my responsibilities include satellite solutions for wireless, Verizon's drone program, and business continuity planning for the wireless and business network segments. Immediately before, during, and after Hurricane Ian I was involved in coordinating the pre-storm staging of mobile assets and out of market team resources, leading the deployment of mobile assets after the storm passed, and the recovery and return of mobile assets as the network restoration was completed. We appreciate Chairwoman Rosenworcel's invitation to participate today.

In addition to traditional mobile response solutions like mobile cell sites, portable generators, small satellite solutions, and new more rugged deployable assets like the business incorporated satellite onboard nomadic or "BISON," and tactical humanitarian operations response or "THOR" vehicle that we used on Fort Myers Beach, Hurricane Ian's response contained several noteworthy newer assets.

## **DRONES**

First, recent hurricane events have put a spotlight on new drone-based solutions. Verizon has broadly used drones for tower inspections for over 3 years now, with thousands of flights under our belt. The use of small drones for tower inspection and the ability to see sites with restricted or limited access enables much faster repair and response. We also used larger tethered drones to create flying cell sites to temporarily provide service to Sanibel Island after Ian. This high altitude wireless "kennewhat" or HAWK solution was first deployed during Hurricane Laura in Louisiana in 2020, and was initially tested in the year prior for safety and feasibility.

Solutions such as the HAWK provide a powerful response in the initial days following a storm, before more permanent terrestrial assets can be deployed to restore service. The ability to fly an aircraft and provide cellular service is also a powerful solution for search and rescue in mountainous terrain, providing service in flooded areas, rapidly restoring temporary service following a tornado such as in Mayfield, KY earlier this year, or in island isolation scenarios with limited access as we saw in Hurricane Ian. But using drones this way requires substantial effort and investment. Under current FAA rules, there must be eyes on the drone 24x7, which necessitates a team of folks staying with the asset during deployments. Longer term, we expect to use multiple HAWK units to create a mesh network of temporary coverage quickly following a major event to ensure critical communications are available when people need them the most.

## **SATELLITE**

Verizon has also tested advanced satellite technology such as mid-earth orbit or MEO and low earth orbit or LEO for several years and has deployed satellite solutions to temporarily replace fiber backhaul to connect cell sites to the core network following network impacting disaster events. Deploying a MEO backhauled small cell solution immediately improved

communications on Fort Myers Beach for public safety and first responders. We've found this solution has much lower latency than geostationary satellite solutions and greater throughput potential. Directional solutions using MEO and LEO satellite constellations will become more common following major events to meet these needs. Verizon deploys its satellite solutions over dedicated link bandwidth which is important when considering that shared bandwidth can and will result in congestion issues as usage of such solutions grows within the consumer and public safety space in the future.

This is just a limited snapshot of our massive investment in the mobile asset solutions we use to support critical communications for consumers and first responders. Thank you for your time today and the opportunity to participate in this discussion.